

Appl. No. 10/694,684  
Response dated 08/29/2005  
Reply to Office Action 06/01/2005

Attorney Docket No.: TS02-1193  
N1085-90160

### **REMARKS/ARGUMENTS**

Claims 1-31 were previously pending in this application with claims 22-30 withdrawn from consideration. Claims 1, 2, 7-9, 12, 17-19 and 31 are hereby amended. Applicants respectfully request re-examination, reconsideration and allowance of each of presently pending  
5 claims 1-21 and 31.

#### **I. Claim Objections**

On page 2, paragraph 3 of the subject Office Action, claims 2-8, 10, 12-21 and 31 were objected to because of various stated informalities. Applicants respectfully submit that these claim objections are obviated for reasons set forth below.

10 With the exception of claim 2, discussed below, each of the particular informalities pointed out by the Examiner, have been addressed and corrected. Claims 7-9, 12, 17-19 and 31 have been amended.

With respect to claim 2, line 7, Applicants point out that claim 2 recites: "The method of claim 1, . . . wherein . . . forming at least one dual damascene opening comprises forming  
15 initial via openings . . ." Applicants respectfully submit that the verb tense of the word "comprises" is correct as presented in Claim 2 and respectfully traverse this claim objection. Applicants therefore request that objection to claim 2 is thus withdrawn.

As such, the objection to claims 2-8, 12-21 and 31 should be withdrawn.

#### **II. Objection to the Drawings**

20 On page 3, paragraph 2 of the Office Action, the drawings were objected to for failing to comply with 37 CFR 1.84 (p)(5) because reference character 50 was not mentioned in the description. Responsive to this objection, the specification has been amended to include reference to reference character 50. The drawing objection should therefore be withdrawn.

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### III. Claim Rejections Under 35 U.S.C. §102

In the Office Action, in particular page 3, last paragraph, claims 1, 2, 7, 10, 11 and 31 were rejected under 35 U.S.C. §102 (e) as being anticipated by Kim (U.S. Patent 6,767,788).

Applicants respectfully submit that these claim rejections are overcome for reasons set forth

5 below.

Claim 1 is an independent claim and claims 2, 7, 10, 11 and 31 depend from independent claim 1. Independent claim 1 has been amended and recites the following features:

forming a capacitance trench . . . ; the capacitance trench having opposing sidewalls;

10 forming respective bottom electrodes along the opposing sidewalls;

forming at least one dual damascene opening adjacent an associated one of the bottom electrodes; and

15 depositing metal a) in the at least one dual damascene opening that laterally contacts the respective bottom electrodes.

Independent claim 1 clearly points out that the dual damascene openings are adjacent the bottom electrodes of the capacitor and that the metal deposited within the dual damascene openings laterally contacts the bottom electrodes of the capacitor.

The cited reference of Kim does not disclose or suggest this feature of forming at least  
20 one adjacent dual damascene opening that provides direct contact to the bottom capacitor electrode(s). As shown in Figures 1E and 1F of Kim, the un-numbered structures that are laterally closest to the capacitance trench i.e. laterally closest to via 19 that includes the trench capacitor 27, a) are not "adjacent" the capacitance trench; b) are not dual damascene structures, and c) do not include metal that contacts the bottom plates of the capacitor electrode, laterally or  
25 in any other manner. "Adjacent" is defined in the Compact Oxford English Dictionary as: next to

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or adjoining something else, [http://www.askoxford.com/concise\\_oed/adjacent?view=uk](http://www.askoxford.com/concise_oed/adjacent?view=uk).

07/11/2005. Claim 1 is therefore distinguished from the reference of Kim and therefore the rejection of claim 1 under 35 U.S.C. §102(e) as being anticipated by Kim, should be withdrawn.

By reason of their dependency from claim 1, claims 2, 7, 10, 11 and 31 are similarly

5 distinguished from Kim and therefore the rejection of these claims under 35 U.S.C. §102(e) as being anticipated by Kim, should similarly be withdrawn.

#### IV. Claim Rejections Under 35 U.S.C. §103

On page 5, paragraph 2 of the Office Action, claims 3-6, 8 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kim as applied to claims 1, 2, 7, 10, 11 and 31 and  
10 further in view of Wang, et al (U.S. Patent 6,589,862), hereinafter "Wang," and the Examiner's comments. Applicants respectfully submit that these claim rejections are overcome for reasons set forth below.

Claims 3-6, 8 and 9 depend from claim 1 which is distinguished from Kim for reasons set forth above.

15 Wang has apparently been relied upon for providing materials such as Si<sub>2</sub>, SiN, and SiON for use as etch stop layers. The Examiner also indicates that the selection of suitable thicknesses for the various claimed layers would be obvious as a matter of determining optimum process conditions by routine experimentation. The reference of Wang and the Examiner's comments do not make up for the above-stated deficiencies of Kim and therefore claim 1 and  
20 also dependent claims 3-6, 8 and 9 are distinguished from the references of Kim and Wang in view of the Examiner's comments and therefore the rejection of claims 1, 3-6, 8 and 9 under 35 U.S.C. §103(a), should be withdrawn.

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**V. Rejection of Claims 12-21 Under 35 U.S.C. §103**

On page 7, 3<sup>rd</sup> paragraph, claims 12-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kim in combination with Wang and the Examiner's stated comments.

Applicants respectfully submit that these claim rejections are overcome for reasons set forth

5 below.

Claim 12 is the independent claim of this set of rejected claims and claim 12 has been amended. Independent claim 12 recites the features of:

forming a capacitance trench . . . ; the capacitance trench having opposing sidewalls . . . ;

10 forming respective bottom electrodes over the capacitance trench opposing sidewalls;

forming respective opposing initial via openings adjacent the capacitance trench;

15 forming respective trench openings above, continuous and contiguous with lower portions of the respective opposing initial via openings and exposing . . . respective bottom electrodes; and

forming planarized metal portions within the dual damascene openings.

Clearly, the planarized metal portions within the dual damascene openings formed  
20 adjacent the capacitance trench contact the bottom electrode(s) of the capacitor which are exposed and the dual damascene opening is formed.

Kim does not and cannot recite the feature of providing dual damascene openings adjacent the trench capacitor wherein the dual damascene openings expose bottom electrodes of the capacitor and are subsequently filled with metal that provides contact to the bottom capacitor  
25 plates. Kim cannot provide this feature for reasons discussed above, i.e., the closest laterally disposed openings to Kim's capacitance trench are neither a) adjacent the capacitance trench, b)

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dual damascene openings, nor c) metal containing structures in which the metal is in contact with the bottom electrode plates. Claim 12 and therefore dependent claims 13-21 are therefore distinguished from the reference of Kim.

Again, Wang has apparently been relied upon for providing a layer using a SiO<sub>2</sub>, SiN, or SiON material and the Examiner's comments indicate that the selection of suitable thicknesses for the various films and structures are obvious as a matter of determining optimum process conditions by routine experimentation. The reference of Wang and the Examiner's comments do not make up for the above-stated deficiencies of Kim and therefore claims 12-21 are distinguished from the references of Kim and Wang in view of the Examiner's comments.

Therefore, the rejection of claims 12-21 under 35 U.S.C. §103(a), should be withdrawn.

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VI. Conclusion

Based on the foregoing, each of claims 1-21 and 31 is in allowable form and the application therefore in condition for allowance, which action is respectfully and expeditiously requested.

5 The Assistant Commissioner for Patents is hereby authorized to charge any fees or credit any excess payment that may be associated with this communication to Deposit Account 04-1679.

Respectfully submitted,

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